Hot Spot Exposure Assessment Program
Office of Transportation and Air Quality
Air Toxics Center

The EPA Office of Transportation and Air Quality (OTAQ) has established a monitoring plan to assist regulatory agencies in the development of models to accurately identify and assess personal exposures to air toxics in microenvironments. The emphasis of this work plan is to quantify the impacts from mobile source generated toxics. A number of studies have been or are currently being conducted by the EPA and other environmental agencies assessing personal exposures to air toxics. OTAQ plans to participate in a number of these studies to specifically investigate impacts from mobile sources in select microenvironments. A summary of the projects is listed:

Fresno Asthmatic Children's Environment Study (FACES)

1. Overview
   - Prospective study of the effect of air pollution on 450 asthmatic children.
   - Examines short term effect of daily air pollution on the symptoms, medication use, and lung function of these children and the longer-term effect on the progression of asthma.
   - Assess temporal and spatial distributions of particulate matter (PM), including toxic components, at multiple microenvironments including homes (~100), schools (~25), and near roadways.
2. Information to OTAQ
   - Provides critical data on the temporal and spatial variability of particulate air toxics generated from mobile sources, and the impact of these toxics in multiple microenvironments (in-home, in-school, near roadway).
   - Provides data to evaluate and improve existing exposure models, such as HAPEM, by assessing the relationship of personal exposures with microenvironment concentration measurements.
   - Provides the agency with data on associations among environmental exposures to mobile source toxics and adverse health effects for asthmatic children.
   - Allows enhanced source apportionment of particle phase mobile source air toxics (MSATs) for outdoor, indoor, and personal measurements, and may provide the ability to better identify differences between diesel and gasoline emissions.

Baltimore Traffic Study

1. Overview
   - Assessment of mobile source impacts on indoor and outdoor air pollution concentrations of PM and gaseous toxics in a home and school in an ambient hot spot location.
   - Assess exposures by comparing continuous, fixed-site measurements with the time-course, sensitivity and specificity of biomarkers among volunteer subjects occupying a fixed site row home.
   - Characterize the exposure distribution and investigate the health effects of mobile source related air pollution among inner city asthmatic children.

2. Information to OTAQ
    - Provides critical data on the temporal and spatial variability of gaseous and particulate air toxics generated from mobile sources, and the impact of these toxics in multiple microenvironments (in-home, in-school, near roadway).
    - Identifies associations among environmental exposures, personal exposures, and biomarkers which can be used to identify and quantify the contribution of mobile sources to the exposure levels.
    - Allows enhanced source apportionment of MSATs for outdoor, indoor, and personal measurements.

<u>Los Angeles School Bus Exposure Assessment</u>

1. Overview
    - Quantify in-vehicle, outside vehicle, near vehicle (bus stop), and ambient exposures to diesel exhaust.
    - Identify specific scenarios and factors that lead to the highest air pollutant exposures of children while commuting on diesel school buses or waiting at bus stops.
    - Identify association between exposures and comprehensive vehicle characterization
        - Fuel Analysis
        - Vehicle/Engine Information
        - Tailpipe Emission Characterization
2. Information to OTAQ
    - Data on exposures to air toxics for school children during commutes in diesel school buses from multiple microenvironments (in-bus, outside bus/bus stop, in neighborhood).
    - Associations between vehicle operating characteristics and exposures to air toxics.
    - Assessment of the effectiveness of control technology (diesel retrofits) on reducing exposures to school children.